

Selected User Problems and Version 4.2.1 Features

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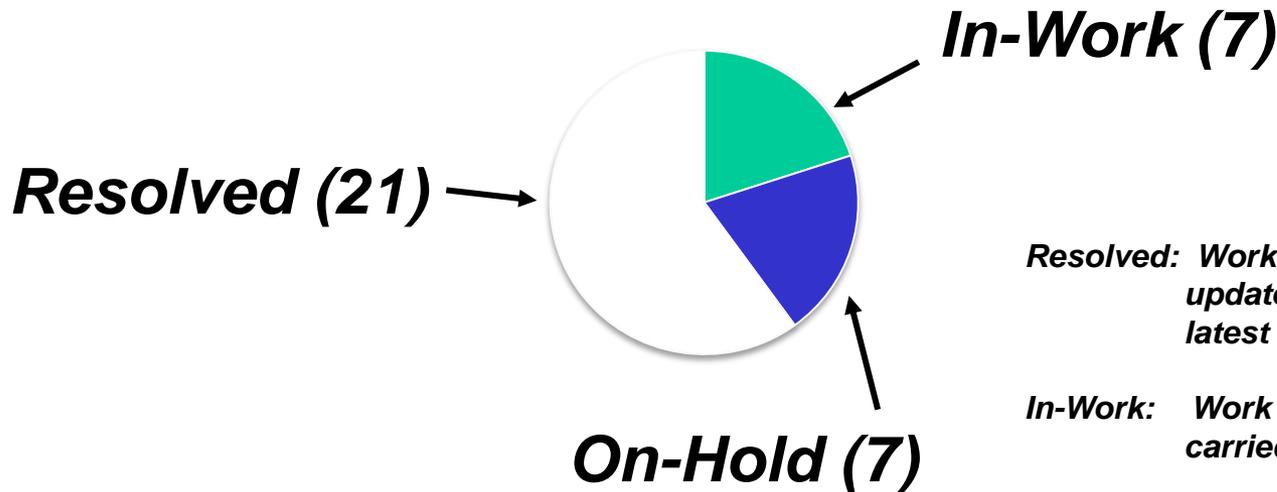


User Problem History

September 2013 – August 2014

35 reported

24 additional older problems were resolved



Resolved: Work has been completed on user problem, update has been submitted, and update is in latest developmental version

In-Work: Work on user problem is currently being carried out

On-Hold: Work has not begun on user problem, or work was begun on user problem but work is now stopped on user problem

Selected User Problems

- ***UP# 14004***
- ***UP# 14005***
- ***UP# 14015***
- ***UP# 14016***
- ***UP# 14023***

Problem 14004

- The variables `print`, `m_rring(1,4)`, `m_rring(2,4)`, and `m_rring(3,4)` were added to subroutine `PLTWRT`, and the size of array `'plotdata'` was increased by 4 to account for this change. However, the arrays `'plotalf'` and `'plotcnt'` were not bumped by 4 in subroutine `WRPLID` as they should have been. This causes a corruption of the plot file for all problems that use the moving problem option.
- ***Root Cause: Incorrect array sizes.***
- ***Resolution: Resolved. Block "bt1" was created in common block VREQD.H to store the variable names. Variable "nbt1" and array "bt1" were added to VREQS.H. Added read of plotalf and plotnum initialization to WRPLID. Increased size of plot storage data arrays by 4 for Variable gravity problems. Corrected and activated setting of plotdata in PLTWRT.***

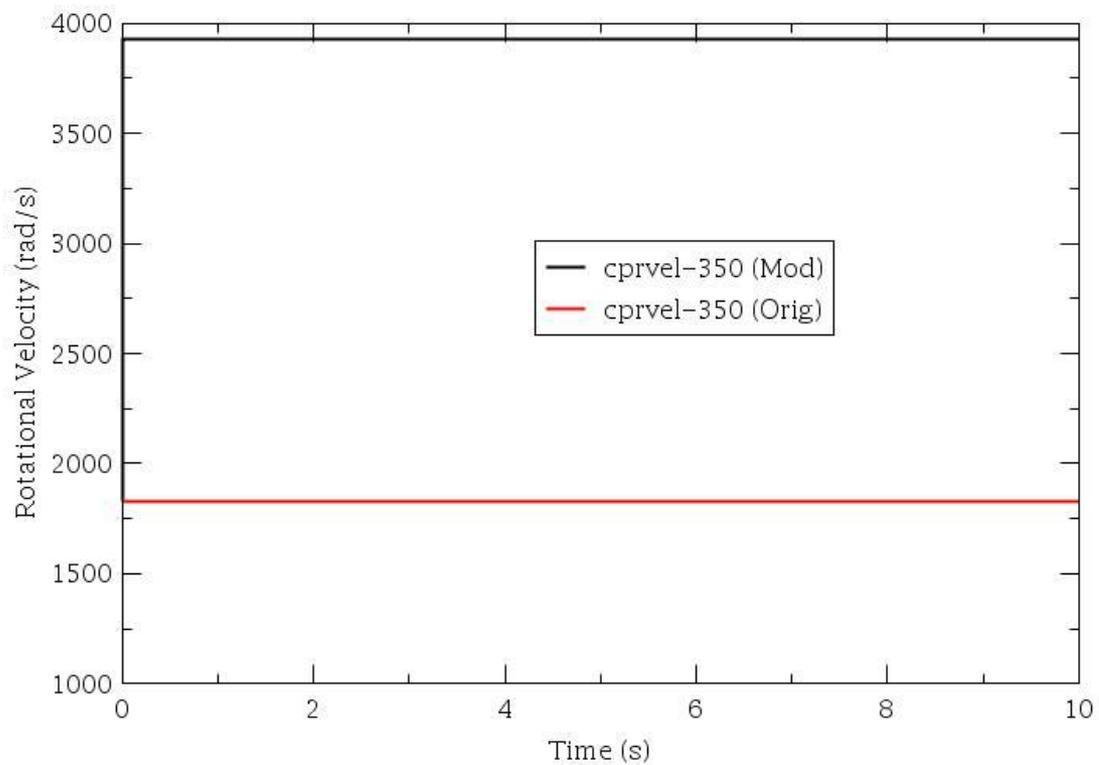
Problem 14005

- ***Symptom: A code user is experiencing a code failure when using the moving problem model. This problem was confirmed to fail on Linux and will run if you comment out the 2090N00X cards.***
- ***Root Cause: Index out of bounds.***
- ***Status: Resolved. An index for variable 'xin' in subroutine SEARCH.F was found to be out of bounds. Modified this routine so that the index could not exceed the size of the array. This problem now runs to completion.***

Problem 14015

- **Symptom: A compressor problem that uses a control system to control the compressor's speed is not being adjusted correctly by the control system in Version 4.1.3. Instead the compressor speed is holding constant at its initial value. It was working in 242.**
- **Root Cause: Uninitialized variable.**
- **Status: Resolved. Variable 'icospd(1)' was not set correctly in the code. Because this variable was not set, the code assumed there was no speed table to be used. This was a conversion error, and was corrected. This problem is now fixed.**

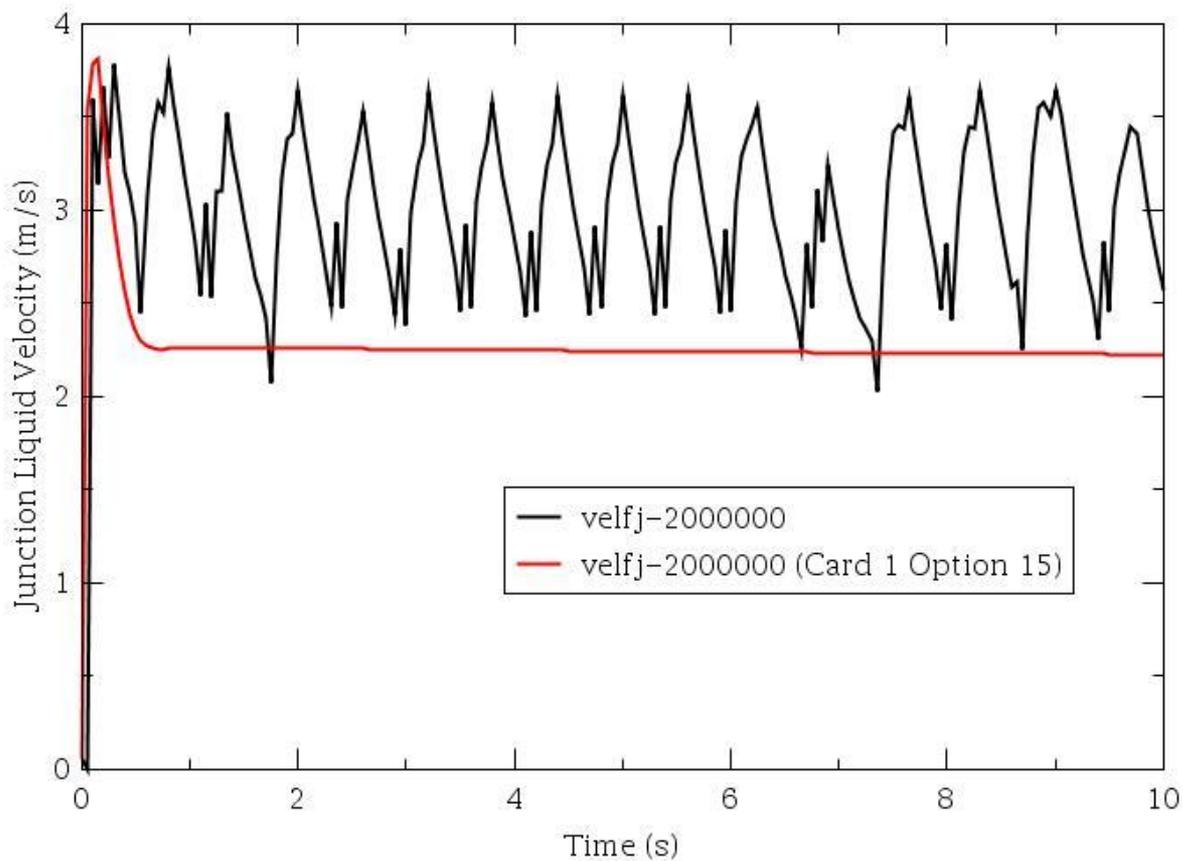
Problem 14015



Problem 14016

- **Symptom:** *A deck that has a 1-volume pipe component with a sink and source time-dependent volume gives results that are noisy. When a second unconnected system is added to the deck, the results are smooth.*
- **Root Cause:** *Violation of the Courant limit.*
- **Status:** *Resolved. Found that the issue is with the Courant limit. The Courant limit is determined by listing the smallest values of the Courant limit for each active volume in a deck. The default code uses the second value on the list for the Courant limit. For a single volume case (as is the case with the single system deck), the second value on the list is undefined. This causes a violation of the Courant limit by the calculation and caused the observed error. By adding Card 1 Option 15, this problem is eliminated. Card 1 Option 15 was made a permanent part of the code in version 4.2.1. With the institutionalization of this card, the problem is resolved.*

Problem 14016



Problem 14023

- **Symptom:** An HTTF problem fails immediately on restart from steady state to transient with a banded matrix singularity. The default BPLU solver is being used. The IRUG external release Linux executable version of 4.2.1 is being run.
- **Root Cause:** Uninitialized Variables.
- **Status:** Resolved. The solver correctly identified that the matrix was singular. Found that variable 'ht2cx' was not initialized correctly in the 2D conduction coding. Because the variable wasn't set after allocation, so values of the array were 'NaN'. The variable was set to 0.0 after allocation, which resolved the issue. Other similar variables were also initialized to 0.0.

Version 4.2.1 Features

- **Nucleate boiling heat transfer coefficient multiplier implemented**
 - The nucleate boiling heat transfer coefficient multiplier was implemented. This option is controlled with Word 13 in the 20 word format for the 1CCCG801 through 1CCCG899 (and 1CCCG901 through 1CCCG999) cards.
See Vol. 2, Appendix A, Section 8.
- **Card 1 Option 15 institutionalized**
 - Card 1 Option 15 was institutionalized. The code could previously violate the Courant limit. With this change, the code no longer violates the Courant limit. Using Card 1 Option 15 now results in an input error. The previous functionality of the code can be accessed using Card 1 Option 22.
See Vol. 2, Appendix A, Section 2.

Version 4.2.1 Features, cont.

- **MA18 solver restart issues corrected**
 - Restart cases that use the MA18 solver were corrected. The restart capability using this solver did not work previously.
- **Plot file for “moving” problems corrected**
 - The plot file for problems using the “moving” option was damaged in the previous version. It has been corrected for this version.
- **Control variable controlled compressor speed corrected**
 - Controlling the compressor speed with a control variable was not functioning correctly, this issue was corrected.
- **Verification testing results improved**
 - Some problems that did not previously pass verification testing for restart or backup have been corrected.
- **User problem corrections**
 - Various user problems have been found and fixed in this version.

Questions?